A Frictional Resistance Exercise Apparatus

By

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Field of the Invention

This invention generally relates to exercise equipment. More particularly, this invention pertains to a portable exercise apparatus for use in a doorway and/or in conjunction with a door that utilizes sliding friction in conjunction with a weight to provide resistance.

Background

In the past 15 to 30 years, exercise and weight training has become very popular.

Traditional weight training typically uses free weights to maximize the amount of work done by a targeted group of muscles. Typically, the weights are attached the barbells, which a user moves in a desired manner to exercise the targeted muscles. Because the weights are not restrained but merely held by the user, there is a significant risk of injury to the user or someone else nearby if the user accidentally let's go of the weights. Furthermore, dropped weights can cause damage to floors and other surrounding surfaces. Another disadvantage of free weights is that a user can strain or otherwise injure his or her muscles if his or her technique of using the weights is improper.

For reasons of safety and convenience, weights have been incorporated into mechanical gyms wherein the user pulls or pushes on handles to raise or lower a set of weights connected to the handles by way of pulleys and cables. These gyms often require substantial support structures to contain the weights and direct the cables and pulleys. Accordingly, these gyms are usually bulky and heavy and are not particularly suited for use in residences, especially smaller residences, such as apartments, where space is at a premium. Additionally, these gyms are relatively expensive and tend to provide resistance in a single plane only versus the multi-plane resistance to movement permitted when a device having a rope pull is utilized...

In the recent past, a number of exercise gyms and apparatus that do not use weights have found their way into the marketplace. To provide the necessary resistance to work muscles these gyms and apparatus rely upon various types of load inducing mechanisms. Some typical mechanisms include springs, elastomeric bands, resilient rods, pneumatic or hydraulic cylinders,

wind resistance and magnetic and electronic load resistance mechanisms. In general, the devices relying on alternative load inducing mechanisms also require a framework or support structure although the framework is often much more compact and lighter than the framework of a gym utilizing weights making it more suitable for use in a residence. Nevertheless, such devices still typically require a substantial amount of space.

The most compact of home exercise devices are those that utilize gravity in combination with a user's own weight to provide the necessary load to work the user's muscles. These devices, however, are limited in the amount of load or resistance that can be applied to particular muscle group.

A number of devices have been proposed that utilize frictional resistance to provide an exercise load, such as the devices described in US patents numbers and 4,343,466, 4,560,160, 5,352,172, 3,510,132. Generally, each of these devices includes one or more handles or grips that are attached to a rope which is wrapped around a friction inducing member. Unfortunately, none of these devices provide a means for automatically returning the handles or grips to their pre-actuated positions. In other words, once the user pulls or pushes a first handle or grip, he or she must typically pull a corresponding second handle or grip to return the first handle or grip into its pre-actuated position. Because of this, a user of one of these frictional resistance exercise devices can not simultaneously exercise both arms. For example, a user can only perform a curl exercise on one arm at a time. Further, a user cannot simulate a bench press exercise.

Another major disadvantage of several of these prior art frictional resistance devices is that they or associated bracketry must be permanently or fixedly attached to a wall or other surface, such as with bolts or screws. This is especially disadvantageous to apartment dwellers or others who cannot or do not want to permanently fix something to the walls or floor of their residence. None of these devices provide a convenient means for easily and removably securing the devices to a potion of a residential structure, such as a door or doorway.

Summary of the Invention

In one preferred embodiment of the present invention, a frictional resistance exercise device is described. The exercise device includes a weight, a rope, a T-shaped cylindrical member and a structural support. The rope has first and second ends wherein the first end includes a hand grip and the second end has the weight attached thereto. The T-shaped

cylindrical member has an exterior surface around which the first rope is wrapped. The T-shaped cylindrical member is coupled to the structural support.

In another preferred embodiment, another exercise device is described. This exercise device comprises a weight, a rope, a cylindrical member and a structural support. The rope has first and second ends wherein the first end includes a first hand grip and the second end has the weight attached thereto. The rope is wrapped around an exterior surface of the cylindrical member. The structural support is coupled with the cylindrical member and includes one or more lips. The lips are adapted to brace against molding surrounding a doorway to hold the structural support in place generally at the top of a doorway.

In yet another preferred embodiment, yet another exercise device is described. This exercise device comprises first and second weights, first and second ropes, at least one door-mountable rope guide, first and second cylindrical members and a structural support. Each rope has first and second ends. The first end includes a first hand grip and the second end has one of the first and second weights attached thereto. The at least one door-mountable rope guide includes (i) a slot adapted to fit over a top edge of a door and (ii) one of a rope guide slot and pulley adapted to guide one of the first and second ropes over the top edge of the door. Each of the first and second cylindrical members has an exterior surface around which one of the first and second ropes is wrapped. The structural support comprises a planer section upon which the first and second cylindrical members are coupled wherein the cylindrical members are (i) generally axially aligned with each other, and (ii) spaced from each other a sufficient distance to permit a person to lie on the planer section therebetween.

Summary of the Drawings

Figure 1 is an isometric front view of the first resistance apparatus according to one embodiment of the present invention.

Figure 2 is an isometric side view of the first resistance apparatus illustrating the associated braking mechanism.

Figure 3 is an isometric view showing a person exercising using the first resistance apparatus.

Figure 4 is a flow chart concerning the set up and use of the first resistance apparatus.

Figure 5 is an isometric front view of the second resistance apparatus in conjunction with its corresponding rope assemblies.

Figure 6 is an isometric side view of the second resistance apparatus taken along line 6-6 of Figure 5 illustrating the associated braking mechanism.

Figure 7 is an isometric view showing a person exercising using the second resistance apparatus.

Figure 8 is a flow chart concerning the set up and use of the second resistance apparatus.

Figure 9 is an isometric side view of an alternative braking mechanism.

Detailed Description

Embodiments of a compact, portable, relatively low cost and relatively lightweight exercise device are described. Embodiments of the invention utilize one or more weights in combination with rope friction to provide resistance load far greater than would be provided by the weight alone. Further, embodiments of invention make use of a doorway and an associated door to provide the structural framework for the exercise device without being permanently attached to either the doorway or the associated door. By changing the configuration of the various components of the embodiments of the exercise device, a user can use the device to perform a multitude of different exercises. Additionally, a user of the device can easily adjust the load resistance be either changing the magnitude of the frictional rope resistance or by changing the mass of the weight utilized.

The various embodiments of the present invention offer significant advantages over prior art exercise devices. For example, embodiments of the present invention are safe compared to many other home gyms and exercise devices. The mass of the weights utilized are relatively small (typically under 10 lbs) compared to up to hundreds of pounds with free weights and weight-based home-gyms. Accordingly, the potential to get injured by the weights are much less than if they weighed more and no spotter is required to assist a person during exercise as would be required to safely utilize free weights. Further, because of the use of rope friction, embodiments of the present invention exhibits little reverse action. In other words, if a user releases the handle(s) (or grip(s)) of the device while exercising, the weight does not rapidly and forcefully return to its resting position in contrast to weight-based home gyms. Rather, the weight is slowly returned to its resting place due to braking provided by the rope resistance.

Additionally, unlike other exercise devices utilizing fictional resistance, embodiments of the present invention can be utilized to perform exercises using both arms simultaneously such as a bench press exercise, a two arm curl exercise, and chest press exercise. Further, because the weight(s) is utilized in addition to fictional resistance, the weight and the handles are returned to their pre-actuation position automatically albeit in a controlled manner without the user having to pull on the other end of an associated rope.

The advantages of the present invention and its various embodiments and the specific embodiments illustrated in described herein are not intended to be construed as limiting. Rather, numerous variations have been contemplated that read upon the appended claims and are intended to be within the scope of the invention.

Terminology

The term "or" as used in this specification and the appended claims is not meant to be exclusive rather the term is inclusive meaning "either or both".

References in the specification to "one embodiment", "an embodiment", "a preferred embodiment", "an alternative embodiment" and similar phrases means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least an embodiment of the invention. The appearances of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment.

The term "coupled" refers to two or more elements that are connected together but not necessarily directly connected together. For example, a rope is coupled to a support member even if the rope is not in direct contact with the support member if there is an intervening element or set of elements that are connected to both the rope and the support member.

The term "weight" as used herein refers to any element utilized to provide mass to the exercise device. For example, the weight could include a metallic plate commonly used in exercise devices, a container containing a desired amount of solid particulate or liquid, or any other element of suitable mass.

The term "rope" as used herein refers to any flexible elongated material or combination of materials that has a length that is typically at least in order of magnitude greater than the material's width. Accordingly, "rope" includes, but is not limited to, cord, cable, wire and twine.

The term "T-shaped cylindrical member" as used herein refers to any cylindrical element that has a protrusion extending generally perpendicularly therefrom. The protrusion may be cylindrical in shape as well. Typically, the protrusion extends from proximate a center location along the length of the cylindrical member. In one preferred embodiment, the T-shaped cylindrical member comprises a copper tee and associated copper piping, such as is typically used in plumbing applications. The copper pipe permits the rapid dissipation of heat generated as the rope frictionally slides along the surface of the cylindrical portion and the protruding portion of the T-shaped cylindrical member.

One Preferred Embodiment of the Exercise Device

One preferred embodiment of the exercise device comprises a system including several distinct components. A first resistance apparatus 105 (see Figures 1-3) that is attachable the molding 110 surrounding a doorway includes a first T-shaped cylindrical member 115 to provide resistance to the free movement of a rope 120 that is selectively wrapped therearound. A second resistance apparatus 125 (see Figures 4-6) that rests upon a floor or ground surface includes second and third T-shaped cylindrical members 130 & 135 that also provides finely adjustable resistance to the free movement of other ropes 140 & 145 there are selectively wrapped therearound. Other components include: weights, such as weight bottles 150 they can be filled with water or sand; the aforementioned ropes; over the doorway rope guides 155; and exercise handles (or grips) 160. The first and second resistance apparatus can be used in concert with each other or separately depending on the particular type of exercise a user desires. Furthermore, in certain configurations, two weights connected with two ropes terminating in two exercise handles can be utilized to allow simultaneous exercise of both arms, or in other configurations, a single weight, rope and exercise handle can be utilized.

The First Resistance Apparatus

Referring to Figures 1-4, the first resistance apparatus 105 is illustrated. The first resistance apparatus comprises corresponding left and right mounting pieces 165 & 170 that provide the structural support for the first T-shaped cylindrical member 115 that is received into a circular openings 175 (or bores) in each of the mounting pieces. The first resistance apparatus further includes an elongated bolt 180 and corresponding wingnut 185 that is used to join the

first and second mounting pieces together. Also, a directional braking mechanism 190 is provided on the right mounting piece to inhibit the first T-shaped cylindrical member 115 from rotating in a first direction (clockwise in Fig. 2) but permitting the first T-shaped cylindrical member to rotate in a second opposite direction (counterclockwise in Fig. 2).

Each mounting piece comprises a typically planar member 195, which in one preferred embodiment is comprised of wood. The planar member includes the first circular opening 175 that is sized to receive the first T-shaped cylindrical member 115 therethrough. A second circular opening 200 is also provided in each planar member through which the elongated bolt 180 is received to join the first and second mounting pieces together. The top edge of each mounting piece includes a lipped portion 205 that extends perpendicularly from the planar member creating a downwardly facing surface adapted to rest upon a top edge of the molding 110 that surrounds a typical interior doorway. In one preferred embodiment, the lipped portion also comprises a piece of wood, although in alternative embodiments the lipped portion can comprise any suitable material including plastic and metal. Furthermore, the lip portion and the planar member may be integrated as a unitary piece.

A second lipped portion 210 is also provided in each mounting piece 165 & 170 that is generally vertically oriented and is located along the vertical edge of the planar member 195. Similarly to the first lip portion 205, the second lip portion extends perpendicularly from the planar member. The second lipped portion creates a generally vertically oriented surface adapted to be butted up against the outside edge of the vertically extending side molding 115 of a typical doorway. In one preferred embodiment, the second lip portion is also constructed from wood; however, it can be comprised of any suitable material and like the first lipped portion, the second lip portion can be integrally fabricated with the corresponding planar member.

As best illustrated in Figure 1 and Figure 2, the left mounting piece 165 is placed against the molding 115 on one side of a doorway in an upper corner thereof while the corresponding right mounting piece 170 is placed against the molding on the other side of the doorway in the same corner. Each piece is joined together by passing the elongated bolt 180 through the corresponding openings 200 and tightening the bolt in place with the wingnut 185. It is to be appreciated that the first T-shaped cylindrical member 115 is slid through its corresponding openings as the first resistance apparatus is secured to the doorway.

Referring to Figure 1, the first T-shaped cylindrical member 115 typically comprises an elongated copper tube 220 approximately 1 in. in diameter that extends through the corresponding openings in the right and left mounting pieces when the first resistance apparatus is attached to a doorway. In one variation, the T-shaped cylindrical member comprises a commonly available 1" copper tee with a ¾" copper tube extending through it. Proximate the longitudinal middle of the cylindrical member to a protrusion 215 extends perpendicularly. Typically, the protrusion is also cylindrical and has a diameter of about 1 in. Ideally, the surfaces of the first T-shaped member, including the surface of the protrusion, are smooth to minimize heat buildup and abrasion of the associated rope 120. Further, the intersecting transition between the elongated cylindrical portion and a perpendicular protrusion is gradual rather than abrupt such that the rope can slide freely thereon. In one preferred embodiment, the first T-shaped cylindrical member comprises a copper pipe tee. As shown, caps 225 can be provided on either end of the first T-shaped cylindrical member and on the protrusion to enclose the ends of the copper tee. Caps may also be omitted to facilitate faster cooling of the member during exercise. In alternative embodiments and variations of the preferred embodiments, the T-shaped cylindrical member can comprise materials other than copper such as, but not limited to, plastics and metals, although copper is generally preferred because of its ability to dissipate heat generated as the rope slides against the cylindrical member.

In one preferred embodiment, a gauge mechanism 230 is provided whereby the user can determine the amount of resistance load that is being overcome during exercise. The gauge mechanism typically comprises a short cylindrical piece 235 having a center bore that is slid over and fixedly secured to the first T-shaped cylindrical member 115 such that it rotates unitarily with the T-shaped cylindrical member. The outside surface of the short cylindrical piece has a width sufficient to receive a gauge ribbon 240 wrapped thereupon. One end of the ribbon is fixedly secured to outside surface while the other end of the ribbon has a weighted position indicator 245 attached thereto. The position indicator, which typically comprises a nail or other elongated metallic bar in one preferred embodiment, extends generally horizontally. As shown in Figure 3, the pointed indicator corresponds to a graduated scale 250 that is affixed to an inside surface of the doorway. Typically, the graduated scale is comprised of either paper or a flexible plastic material with graduations printed on at least one surface. The scale is typically taped or adhesively attached to the inside surface of the doorway. Operationally, as discussed in greater

detail below, the user can determine the relative amount of resistance load by noting the position of the weighted position indicator relative to the gradations on the scale.

Referring to Figure 2, one preferred version of the directional braking mechanism 190 is illustrated. The braking mechanism includes two terminus blocks 255, each having an eyelet 260 extending therefrom. A braking mechanism rope 265 is secured at one end to one of the eyelets, wraps around a portion of the first T-shaped cylindrical member 115 that extends through the right mounting piece 170 and is secured at its other end to an elastomeric band 270. The elastomeric band is secured to the other eyelet. The braking mechanism rope is preferably taught such that the elastomeric band is held in tension. Operationally, attempting to rotate the first T-shaped cylindrical member clockwise applies tension to the braking mechanism rope as it is pulled relative to its connection to the first eyelet, thereby tightening the rope's grip to the surface of the T-shaped cylindrical member around which it is wrapped. Accordingly, the T-shaped cylindrical member is prevented from rotating in a clockwise direction. Conversely, as the T-shaped cylindrical member is rotated counterclockwise, the rope pulls upon the elastomeric band which is secured to the second eyelet. The amount of tension applied to the rope is thereby limited as the elastomeric band stretches. Accordingly, the T-shaped cylindrical member rotates with minimal resistance in the counterclockwise direction. In alternative embodiments and variations of the preferred embodiments, different types of braking mechanisms can be utilized such as, but not limited to, a ratchet and pawl mechanism or the alternative braking mechanism described below with reference to Figure 9.

As will be discussed below, rotating the T-shaped cylindrical member 115 is desirable in order to quickly increase and adjust the amount of frictional load to be applied during exercise. To facilitate easy rotation of the T-shaped cylindrical member in the counterclockwise direction, an adjustment tool 275 is provided as shown in Figure 2. The adjustment tool includes a handle on one end and an elongated bar that extends from the handle. The bar is received into a pair of holes 280 that extend through the T-shaped cylindrical member proximate one end thereof. In one preferred embodiment, the adjustment tool is removable so that it can also be used on the second resistance apparatus described below.

Referring to Figure 3, the first resistance apparatus is utilized in conjunction with a rope 120 that is looped around the T-shaped cylindrical member 115 terminating at a hand grip 160 on one end and a weight, typically a water bottle 150, at the other end. The total resistance load

experienced by a user pushing or pulling on the hand grip is a factor of the weight of the water bottle multiplied by the magnitude of the resistance to movement of the rope against the T-shaped cylindrical member. The resistance of the rope to movement is relative to the total contact angle of the rope in radian around the T-shaped cylindrical member. For instance if the rope is wrapped around the T-shaped cylindrical member less than one complete rotation the resistance to movement will be less than if the rope is wrapped around the T-shaped cylindrical member multiple times. Accordingly, by varying the number of degrees the rope is wrapped around the T-shaped cylindrical member, a user can selectively modify the resistance load experienced at the grip.

Referring to the Figure 4 block diagram, the setup, use and operation of one preferred embodiment of the first resistance device is described. First, the user takes the right mounting piece 170, which typically includes the braking mechanism and places it against and on the molding 110 of a doorway at an upper corner thereof as indicated in block 405. If the T-shaped cylindrical member 115 is not already in place, the user slides the cylindrical member in place as indicated in block 410. Next as shown in block 415, the user places the left mounting piece 165 on the opposing molding on the other side of the doorway while simultaneously sliding an end of the T-shaped cylindrical member through the corresponding opening in the planar member 195 of the left mounting piece. At this point, the first resistance apparatus should be resting upon the molding at the corner and on either side of the doorway. The user then places the elongated bolt through the aligned openings in each mounting piece and secures the bolt in place by threading and tightening a wingnut 185 to secure the bolt and the first resistance apparatus in place as indicated in block 420.

Once the first resistance apparatus is attached to the doorway, the user configures the device to perform a desired exercise. As indicated in block 425, he/she fills the weight bottle 150 with water, sand or another substance until a desired weight is achieved if it is not already filled, and he/she attaches the weight bottle and grip 160 to either end of the rope 120 if they are not already so attached. The user then loops the rope proximate its longitudinal center around the protrusion 215 of the T-shaped cylindrical member 115 as indicated in block 430. To increase the resistance load encountered at the grip 160 as indicated in block 435, the user then takes the adjustment tool 275, places it into the corresponding holes 280 proximate the end of the T-shaped cylindrical member and rotates the T-shaped cylindrical member in a counterclockwise

direction to wrap the rope around the T-shaped cylindrical member increasing the total angle of contact between the rope and the T-shaped cylindrical member.

If the user desires to know the amount of resistance required to operate the apparatus, he/she can hook a scale, such as a common fish weight scale, to the end of the grip and pull the scale to determine the effective load as indicated in block 440. If the user has a plastic or paper graduated scale 250 as described above, he/she can place the graduated scale 250 on the inside of the doorway by aligning the metal indicator 245 described above with the indicia corresponding to the weight indicated when the weight scale was pulled. Accordingly, the user can then utilize the gauge mechanism 230 when making adjustments to the relative resistance load.

After the device is completely setup and optionally calibrated, the user can perform any suitable exercise by pulling or and/or pushing the grip 160 as indicated in block 445. Subsequent to the pulling or pushing of the grip, the user relaxes his/her application of force against the grip and lifts up lightly on the grip to permit the grip and associated portion of the rope 120 to retract towards the first resistance apparatus as the weight bottle 150 is pulled downwardly by the force of gravity. Unlike substantially weight based exercise equipment, the grip retracts in a controlled manner as the frictional resistance of the rope sliding against the T-shaped cylindrical member 115 slows the rate of recoil. Advantageously, unlike many prior art exercise apparatus utilizing frictional resistance, the first resistance apparatus does not require the user to manually reset the grip and the rope by pulling on the other end of the rope opposite the grip. Further advantageously, there is no spring back of the weight that could cause injury or damage to items, persons and household animals located near the weight.

The Second Resistance Apparatus

Referring to Figures 5-8, the second resistance apparatus 125 is illustrated in conjunction with two ropes, their associated weights and grips and two rope guides for directing each rope over and around the top of a door. The second resistance apparatus comprises: a planar base member 285 adapted to be placed on a ground surface; first and second T-shaped to cylindrical members 130 & 135; and a pair of flanges 290 for each T-shaped cylindrical member to couple with the planar base member. Further, a braking mechanism 300 that is generally similar to the braking mechanism 190 of the first resistance apparatus 105 is associated with each T-shaped cylindrical member.

The planar base member 285 can be comprised of any suitable material including wood, plastic and metal. The base member is adapted to rest on a ground surface such as a floor and may include feet (not shown) mounted to the bottom side thereof. Generally, the base member is substantially rigid such that it flexes only minimally when utilized in the performance of exercise. The base member is typically configured as a rectangle with a pair of flanges 290 extending perpendicularly from its top surface proximate each widthwise end of the base member. The length of the base member is typically long enough such that a user can either stand between the pairs of flanges and their associated T-shaped cylindrical members 130 & 135 (see Figure 7) or lay down upon the base member with his/her shoulders resting on the top surface.

The pairs of flanges 290 can also be comprised of any suitable material including wood, plastic and metal. The flanges extend generally perpendicularly from the top surface of the base member 285 and are fixed to the base member. Each pair of flanges includes an outside flange 305 located proximate the edge of the base member and an inside flange 310 spaced longitudinally relative to the base member from the outside flange. Each flange includes an opening 315 through which a portion of the cylindrical T-shaped member 130 & 135 is received and can rotate or pivot therein. As can be seen in Figure 5, the openings in each pair of flanges for the T-shaped cylindrical members are substantially axially aligned with each other. Similar to the first resistance device, the braking mechanism 300 illustrated in Figure 6 prevents the T-shaped cylindrical member from rotating in a clockwise direction while permitting it to turn in a counterclockwise direction.

The T-shaped cylindrical members 130 & 135 are substantially similar to the T-shaped cylindrical member 115 discussed above concerning the first resistance apparatus 105, and need not be described in any additional detail. As illustrated, caps 225 can be provided to close the ends of the cylindrical members as shown in Figures 5 and 6.

Referring to Figure 6, the braking mechanism 300 is generally similar to the braking mechanism 190 described above with reference to the first resistance apparatus and is provided on the outside surface of each outside flange 305. The illustrated braking mechanism differs from the one discussed above concerning the first resistance mechanism in that the eyelets 260 to which the brake rope 265 and the elastic band 270 are attached are affixed directly into the outside surface of the corresponding flange; whereas, the eyelets 260 of the braking mechanism

190 described above have the eyelets attached to terminus blocks 255 which are in turn attached to the sides of the first resistance apparatus 105. It is to be appreciated that the manner in which the braking mechanism is configured can vary while still accomplishing the desired functionality.

Because the second resistance apparatus includes two T-shaped cylindrical members 130 & 135, it can be utilized to perform exercises on both arms simultaneously as illustrated in Figure 7. Of course, a user can also use the apparatus to perform isolated exercises on a single arm as well. The ropes 140 & 145 utilized with the second resistance apparatus 125 and the corresponding weight bottles 150 and hand grips 160 are substantially similar to the ropes, grips and weight bottles utilized with the first resistance apparatus 105 except the length of the ropes are typically greater than the rope 120 of the first resistance apparatus. In one variation; however, the two single hand grips can be replaced with a single hand bar (not shown) that extends between the corresponding ends of both ropes to which its end are attached to simulate a barbell such as when performing curls. As can be appreciated the ropes are wrapped around a corresponding T-shaped cylindrical member in much the same fashion as described above for the first resistance device.

Further, to facilitate the use of the apparatus 125 in conjunction with a door, two guides 155 are provided that route the associated ropes 140 & 145 over the top of the door. The guides can be made of any suitable material such as wood, plastic or metal and typically include a groove in which the rope slides. The groove can be lined with a low friction material such as Teflon. In variations, the guides can include roller bearings located in the grooves to lower friction, or in other designs that may bear little resemblance to the specific guides illustrated in Figure 5, the guides could comprise freely rotating pulleys.

Referring to the Figure 8 block diagram, the setup, use and operation of one preferred embodiment of the second resistance device 125 is described. First as indicated in block 805, a user places the second resistance apparatus in front of a door that has been opened. Next as indicated in block 810, the user slides the rope over the door guides 155 over the top edge of the door. Assuming the user has already filled the weight bottles 150 with the desired amount of water and/or sand, he/she then places the weight bottles of the opposite side of the door as the second resistance apparatus and places the ropes 140 & 145 in their associated guides as indicated in block 815. After that, the ropes are threaded around the protrusions of the T-shaped

cylindrical members 130 & 135 as indicated in block 820. Finally to complete the setup process as indicated in block 825, the user rotates the T-shaped cylindrical members within their associated pair of flanges 290 using the adjustment tool 275 to wrap or wind the ropes on to the T-shaped cylindrical members to necessary amount to give the desired resistance.

After the setup is complete, the user situates himself on the base member 285. For instance, if the user desires to perform curls, he/she would stand upon the base member facing away from the door as shown in Figure 7. On the other hand, if the user desires to perform a bench press type exercise, he/she would lie on the base member with his/her shoulders generally in alignment with the cylindrical members 130 & 135. As desired, the user may put a pad or pillow down over the base member for cushioning. The user then takes the grips into his/her hands and performs the exercise as indicated in block 830. Similarly to the first resistance apparatus, the weight bottles 150 act to gently return the hand grips 160 to their pre-actuated positions in a safe and controlled manner.

In another set up of the exercise device that is not illustrated herein, both the first and second resistance apparatus 105 & 125 can be used together. First, the second resistance apparatus 125 is placed generally in a doorway such that its longitudinal direction corresponds with the width of the doorway. A single door guide 155 is placed over and associated open door. The first resistance apparatus 105 is attached to the doorway at the upper corner opposite the door. A first rope assembly comprising a weight bottle 150, a rope 145 and a hand grip 160 is threaded into the doorway guide and around one of the T-shaped cylindrical members 135 of the second resistance apparatus. A second rope assembly is then threaded around the T-shaped cylindrical member of the first resistance apparatus only for purposes of directional change. In other words, the rope 120 of this rope assembly is not wound around the T-shaped member 115 but rather is simply looped over it, such that the first resistance apparatus serves as a directional change device similar to that over the door guide. The rope of the second rope assembly is then wrapped around the second T-shaped cylindrical member 130 of the second resistance apparatus. Using this configuration, the user can both curl and bench press in a manner similar to that of the second resistance apparatus as previously described. This configuration, however, may be desirable in certain circumstances such as when the space behind an open door is illustrated in Figure 7 is not sufficient to permit the weight bottles to move freely upwardly and downwardly. Further, this configuration permits a user to move his arms behind his head as desired; whereas,

when using the second resistance apparatus alone, the ability of the user to extend his arms above his head is limited by the door.

An Alternative Braking Mechanism

An alternative braking mechanism that can be used to do either the first or second resistance apparatus is illustrated in Figure 9. In general, the alternative braking apparatus operates in much the same manner as the braking apparatus described above. Specifically, the braking apparatus prevents the rotation of the T-shaped cylindrical member in one rotational direction while permitting rotation in the opposite direction.

The alternative braking mechanism comprises a rope 330 that has been folded in half over onto itself. The rope is wrapped around one end of the T-shaped cylindrical member 130 for several rotations and is coupled to one or more elastic bands 270 at its folded end. The elastic bands are looped over a dowel 335 that extends perpendicularly from the side flange 305 of the illustrated portion of the second resistance apparatus. The free ends 340 of the rope are wrapped, generally in a figure eight form, around two parallel dowels 345 that extend upwardly from a terminus block 350 that is fixedly secured to the side flange. Additionally, each free end of the rope is secured to the terminus block by way of cleat screws 355.

When the rope 330 is tightly secured and wrapped around the T-shaped cylindrical member 130 as illustrated, a user can rotate the T-shaped cylindrical member in a counterclockwise direction but cannot rotate the cylindrical member in a clockwise direction. Accordingly, when exercising and applying a clockwise bias to the cylindrical member when pulling the hand grip, the cylindrical member will not to rotate. However, a user can increase the resistance level of the exercise by rotating the cylindrical member counterclockwise and wrapping more of the rope 155 associated with a grip 160 and the weight 150 around the T-shaped cylindrical member perhaps using the adjustment tool 275 received in the corresponding holes 280 of the cylindrical T-shaped member.

Alternative Embodiments and Other Variations

The embodiments of the exercise device as illustrated in the accompanying figures and described above are merely exemplary and are not meant to limit the scope of the invention. It is to be appreciated that numerous variations to the invention have been contemplated as would be

obvious to one of ordinary skill in the art with the benefit of this disclosure. All variations of the invention that read upon the appended claims are intended and contemplated to be within the scope of the invention.

For instance, the braking mechanisms as described herein are configured to prevent the T-shaped cylindrical member from rotating clockwise and permitting rotation in the counterclockwise direction, but braking mechanisms in variations and alternative embodiments can be configured to prevent counterclockwise rotation and permit clockwise rotation. In other embodiments, the specific configuration of the device may differ substantially from the exemplary devices illustrated but still fall within the scope of the claims.